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Memorandum

Date: **March 15, 2011**

To: **LaDonna Turner, Site Assessment Manager**
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: **Dana Bahar, Manager**
New Mexico Environment Department, Ground Water Quality Bureau, Superfund Oversight Section

Subject: **Pre-CERCLIS Screening Assessment of the Lone Pine Mine Site, Ambrosia Lake Mining District, Cibola County, New Mexico: Further Investigation under CERCLA Recommended**

Site name	Lone Pine Mine (NM0123)	**Street address**	Not Applicable		
City	Not Applicable	**State**	New Mexico	**Zip code**	Not Applicable
County	Cibola County				
Latitude	35°12'12.65" N	**Longitude**	107°47'41.92" W		

Site physical description:
The Lone Pine Mine (Site) is located approximately five miles northeast of U.S. Interstate 40 near Grants, New Mexico (see Figure 1). The Site is situated on Bureau of Land Management (BLM) property, and access to the Site is through private property. The Site is characterized as a "dry" underground mine, with a timbered load-out facility and two adits, encompassing a total disturbed area of approximately two acres. The Site is situated on the crest of Grants Ridge at an elevation of approximately 7,200 feet above mean sea level, and a small southeast-northwest trending arroyo/ephemeral stream is located approximately 0.25 miles below the Site on the northwest slope of the ridge.

Site identification:
The Site identification number is NM0123, according to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division (MMD) database. The Site is one of 97 legacy uranium mines identified within the Ambrosia Lake mining district of the Grants Mineral Belt. Historically, the Lone Pine Mine was also known under aliases such as "Lone Pine No. 3, Little Haystack No. 1-29, John No. 1-4, and Double X 3-5."

Site summary:
Based on Orin J. Anderson's observations (1980), a timbered load-out facility, two south-trending timbered adits (placed approximately 60 feet apart), and an underground powder magazine remain onsite. The mine adits extend approximately 50 to 60 feet underground into the Todilto limestone host rock.

According to Anderson (1980), scintillometer readings as high as 400 counts per second (cps) were measured on the wall surface inside the mine adits, and approximately 150 cps (about 2 times background) at the entrance and mine dump area. However, the extent of the mine dump area was difficult to distinguish from material excavated during construction of the access road.

Based on field reconnaissance performed in April 2008 by MMD's contractor, Souder Miller and Associates (SMA), specific mining features that were observed include two lateral adits extending over an area of approximately two acres into the northern side of Grants Ridge. The upper adit has a wooden load-out structure measuring approximately 15 feet square by 25 feet tall, which served the lower adit.

As part of the field observations, SMA conducted a radiological survey and recorded gamma radiation measurements at a background location and 24 survey locations along the Site access road to the load-out facility. Measurements were taken at the ground surface and four feet above the ground surface at each survey point using a Ludlum Model 19 Micro-R meter to record gamma radiation in micro Roentgen per hour (µR/hr).

The background gamma radiation level was approximately 10 µR/hr. Across the Site, gamma radiation measurements ranged from a minimum of 9 µR/hr to a maximum of 70 µR/hr at the surface, and from 8 to 23 µR/hr for measurements taken at the 4-foot level. One surface measurement exceeded the background radiation level by a factor of three times (i.e. greater than 30 µR/hr).

Targets:
Based on a query of the New Mexico Office of the State Engineer (OSE), Water Rights Reporting System database, from a total of 161 well records (Table 1), there are 71 private/domestic wells within a 4-mile radius of the site (Figure 1). There are five domestic wells located approximately two miles southwest of the Site, and residences are associated with these wells. The area surrounding the Site is predominately range land; however, there is one municipal water supply well (Grants Water Supply System, Well No. 3) located approximately four miles southwest of the Site. The depth to ground water is approximately 115 feet below ground surface in a livestock water well located approximately 1.3 miles east of the Site (Table 1). NMED Superfund Oversight Section (SOS) staff sampled a livestock well located approximately 2.8 miles northeast of the Site in March 2009. The ground water sampling results indicate that total dissolved solids, sulfate, and nitrate/nitrite exceed the New Mexico Water Quality Control Commission (NMWQCC) standards for these contaminants. In addition, dissolved uranium was detected at a concentration of 0.041 milligrams per liter (mg/L), which exceeds the NMWQCC standard (0.03 mg/L).

The surface water pathway has been evaluated and contaminants could potentially migrate offsite via surface water runoff to a small southeast-northwest trending arroyo/ephemeral stream that is located approximately 0.25 miles below the Site on the northwest slope of Grants ridge.

Radiological surveys were conducted (as described in the site summary above) and used for the evaluation of the soil exposure pathway. Soil exposure from elevated radioactivity is limited (but not completely controlled) since access to the Site is through private property. No data acquisition was performed for the evaluation of an air pathway.

Site ownership and Potential Responsible Parties:
The Site is under BLM ownership. Mining was conducted by the Lone Pine Mining Company from 1954 to 1955, and the Permian Basin Uranium Company in 1955.

File review:
The references listed below were reviewed for the development of this pre-CERCLIS screen.

Site reconnaissance:
Orin J. Anderson of the New Mexico Bureau of Mines and Mineral Resources visited the Site in 1980. Souder Miller and Associates (SMA), a contractor to the New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, visited the Site and conducted a radiological survey on April 15, 2008. NMED-SOS staff did not visit this Site as part of the PCS assessment.

Recommendation:
Further investigation of the Site under CERCLA is recommended to assess any physical hazards as well as the areal extent of elevated radioactivity readings (three times greater than background) to determine if threats to human health and the environment exist.

Based on field reconnaissance conducted in April 2008, radioactivity readings ranged from 9 to 70 µR/hr. One surface location exceeded the background level (10 µR/hr) by a factor of three times (i.e. greater than 30 µR/hr). Readings taken at four feet above the ground surface ranged from 8 to 23 µR/hr.

Currently, the existence of regional impacts from legacy uranium sites to the ground water system has not been determined. Ground water impacts from "dry" mines such as this Site could potentially impact the alluvial ground water system through leaching of contaminants from waste rock piles. Furthermore, contaminants could potentially migrate offsite via surface water runoff to a small southeast-northwest trending arroyo/ephemeral stream that is located approximately 0.25 miles below the Site on the northwest slope of Grants ridge.

A comprehensive investigation of potential impacts to ground water from "dry" former uranium mines within the Grants Mining District is recommended as part of regional ground water quality characterization. Depending upon the results of this investigation, site-specific ground water characterization activities may be warranted.

References:
Anderson, Orin J., 1980, Abandoned or Inactive Mines in New Mexico. New Mexico Bureau of Mines and Mineral Resources, Open-file Report 148.

New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, July 2008, Abandoned Uranium Mine Field Survey Project, Lone Pine Mine Report, prepared by Souder Miller and Associates (SMA).

New Mexico Energy, Minerals and Natural Resources Department, Mining and Minerals Division, 2007, Abandoned and Inactive Uranium Mines Database.

New Mexico Environment Department, Superfund Oversight Section, 2010, Geochemical Analysis and Interpretation of Ground Water Data Collected as part of the Anaconda Company Bluewater Uranium Mill Site Investigation (CERCLIS ID NMD007106891) and San Mateo Creek Site Legacy Uranium Sites Investigation (CERCLIS ID NMN00060684), McKinley and Cibola County, New Mexico. Draft Released May 2010.

New Mexico Office of the State Engineer (OSE), 2010, New Mexico Water Rights Reporting System Database, Point of Diversion by Location, 4-mile Radius of Lone Pine Mine Site.

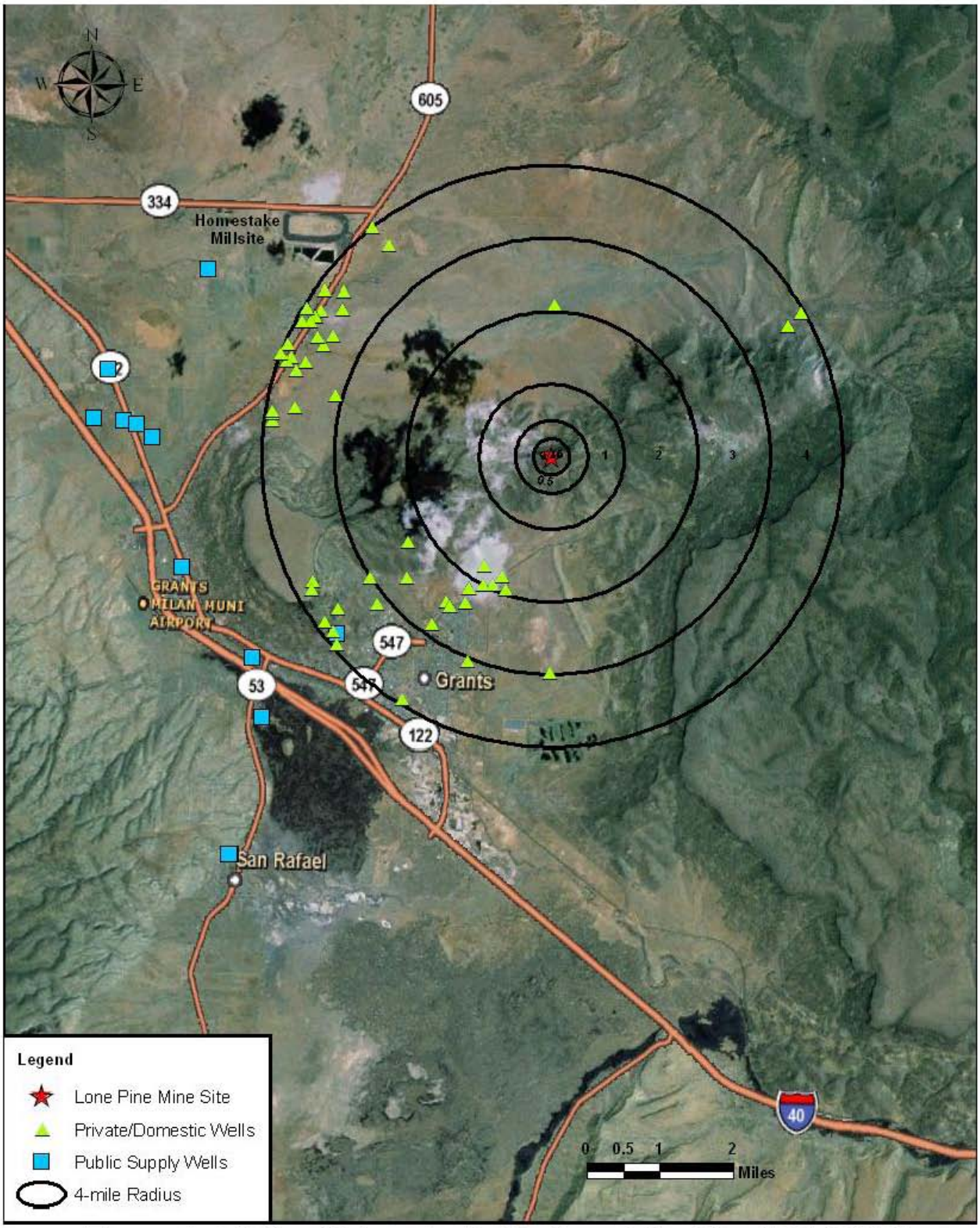

Figure 1: Wells within a 4-mile Radius of the Site (OSE 2010)

Table 1: All Records for Private Wells within a 4-mile Radius of the Site

Well Use (OSE Designation)[1]	Domestic & Livestock (DOL), Domestic-One Household (DOM), and Domestic-Muliple Households (MUL)[2]		Irrigation (IRR), Livestock (STK), and Sanitary/Commercial (SAN)		Exploration (EXP), and Monitoring (MON)		Other/Unassigned		Totals
Distance from Site (miles)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells	Water Level : Well Depth (Feet-BGS)	Number of wells
0 to 0.25	0	NA	0	NA	0	NA	0	NA	0
0.25 to 0.5	0	NA	0	NA	0	NA	0	NA	0
0.5 to 1	0	NA	0	NA	0	NA	0	NA	0
1 - 2	6	90-105 : 114-540	2	115 : 300	23	ND : 49-551	0	NA	31
2 - 3	14	42-122 : 90-630	2	70 : 160	0	NA	1	69 : 92	17
3 - 4	51	50-410 : 82-800	12	100-290 : 150-490	47	20-142 : 50-565	3	ND : 115-125	113
Totals by Category	**71**		**16**		**70**		**4**		**161**

Footnotes:

[1] New Mexico Office of the State Engineer (OSE), 2010, New Mexico Water Rights Reporting System Database, Point of Diversion by Location

[2] Private/Domestic Wells shown on Figure 1.

ND No Data/Not Determined

NA Not Applicable